

Energy News

Snow geese in flight in the Pacific NW [by brent moran](#)

Energy News Summary

The EIA and EPA reported that energy related CO₂ emissions dropped by 3.7 percent in 2012, and are down 12.1 percent from the peak emission year of 2007. Energy related CO₂ emissions have dropped four of the past five years. The factors behind the five year slide are reduced economic output following the Great Recession, high petroleum prices, increased renewable energy and efficiency standards, and increasing fuel economy standards for cars and trucks. The EIA is forecasting that CO₂ emissions will rise slightly in 2013 as economic activity picks up. Washington state is likely following the recent national trend, perhaps exceeding it, but state level CO₂ emission data is only available through 2010: see charts on page 9.

The last two week of March were somewhat of a landmark as the US saw spot prices for natural gas above \$4/MMBtu for the first time since September 2011. Prices have risen since April of 2012 when they hit a low of \$1.95. Several inter-related factors are behind this steady rise in natural gas prices: gas demand has increased over the past year (particularly for electricity generation up 20% in 2012), production growth has slowed (2012 increase of 6%, 2011 7.5%), 2011/12 was the warmest US winter on record (creating a storage surplus last year that we are still working through), and US gas exports have increased, while imports have decreased. The number of new natural gas wells completed has fallen over the last two years so production may flatten, or even decline in 2013-14. Flat or reduced production would further increase natural gas prices and probably result in a rebound in coal-fired electricity generation.

This week the Governor signed his climate change bill. The bill is intended to help the state reach its target of reducing 2020 greenhouse gas emissions levels to those of 1990, and would hire an outside consultant to review the state's ongoing efforts to cut carbon emissions and similar endeavors elsewhere. The consultant would then report back to the governor and legislative leaders.

The Energy Office will include a feature article with each newsletter—this month's article is on page 8.

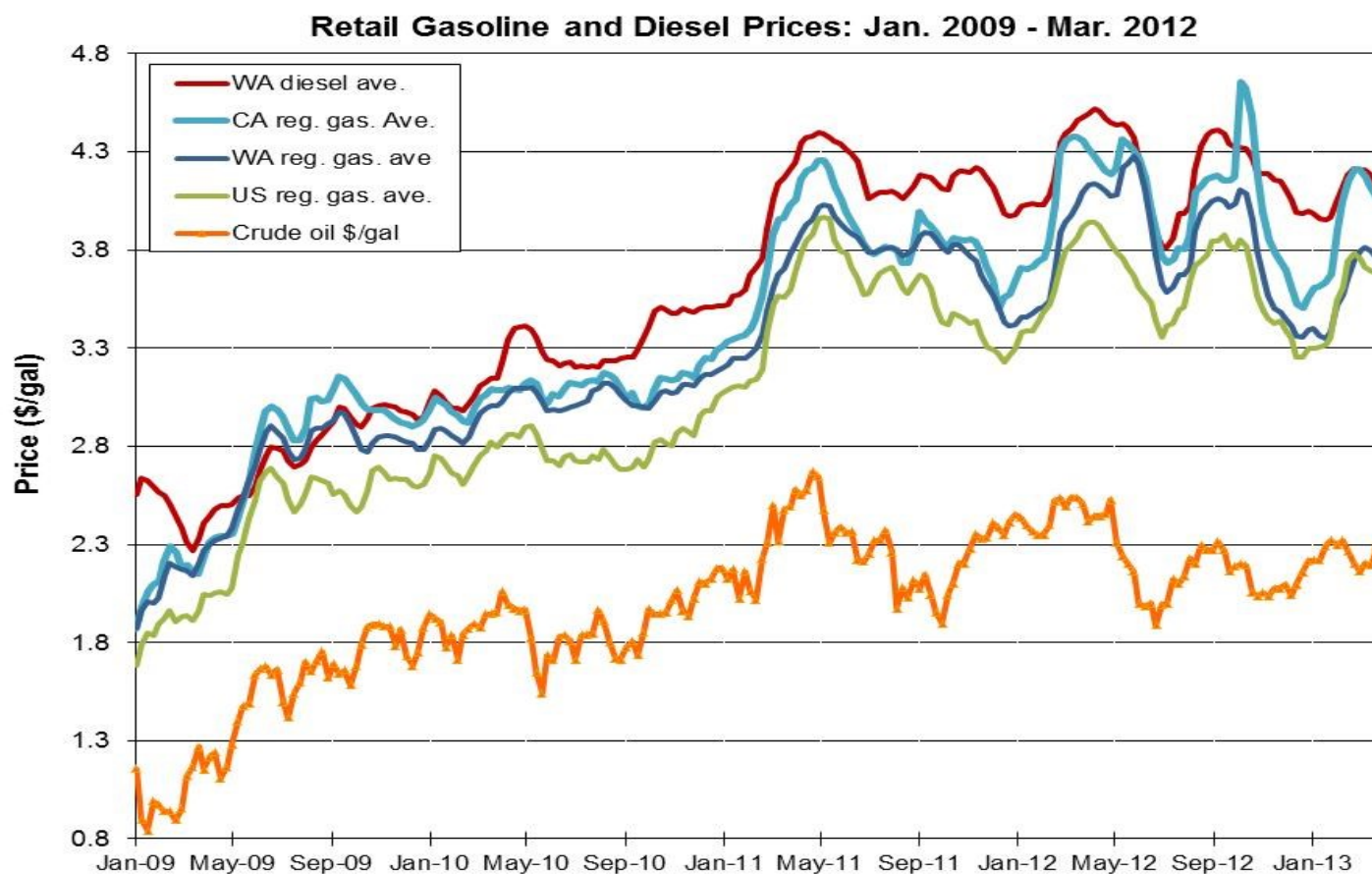
Energy Price Overview

March was similar to February, in that prices for crude oil and refined products moved in opposite directions. This time the relative movements were reversed. Crude oil WTI spot price rose about \$4 to \$96/barrel, possibly in response to good economic news. Spot prices for refined product peaked in late February and have been declining since. NYMEX futures (April-July) prices gasoline, diesel, heating oil, and gasoline are edging down as well. After a rapid run-up during Jan-Feb. national retail gasoline and diesel prices have declined slowly over the past five weeks: national gasoline average at \$3.68/gal, down 10 cents (CA \$4.07), and diesel at \$4.01, down 15 cents /gal (CA \$4.07). National prices rose rapidly as refiners conducted maintenance and begin the switch to low vapor pressure summer blends. Refinery maintenance slows during the spring and summer as refiners try to build fuel inventories for summer travel.

The NYMEX natural gas price (April delivery) has risen steadily the last three weeks, the result of sliding gas storage volumes and cold weather in much of the U.S.: currently at \$4.07/MMBtu up nearly 80 cents. Locally the spot price for gas at Kingsgate is up as well: now at 3.85/MMBtu, up 41 cents. This is the first time the NYMEX natural gas spot prices have been above \$4 since the late summer of 2011.

A reported gas storage draw of 95 Bcf last week is a bit larger than is typical for this time of year. The national natural gas storage figure is at 1781 Bcf and is now only 3.5% above the 5-year storage average. A late seasonal bout of cold weather has dramatically reduced the gas storage inventory from last month.

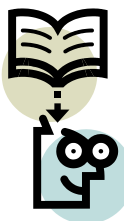
Regional electricity spot price moved higher over the past month. Hydropower generation is still plentiful, but cooler weather and high natural gas prices may have nudged prices upward. The (four-week) Mid C trading hub (on-peak) price ranged from \$27-40 per MWh, and the average electricity monthly spot market price was \$37.2 per MWh, \$8 higher than in the previous report. The Northwest river forecast for the rest of the year is now at 88% of normal.



Energy Headlines –If you only have time to read a few articles—read these.

Governor Inslee's Climate Change Bill Passes Washington State Legislature. Associated Press.

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Dairy finds a way to let cows power trucks. New York Times, Mar. 28.

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Natural Gas Prices Highest Since 2011, Capping a Year of Gains. Denver Business Journal.

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Our carbon, our climate, our cash. New York Times, Mar. 25.

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Days of promise fade for ethanol. New York Times, Mar. 16.

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Life after oil and gas. New York Times, Mar. 23.

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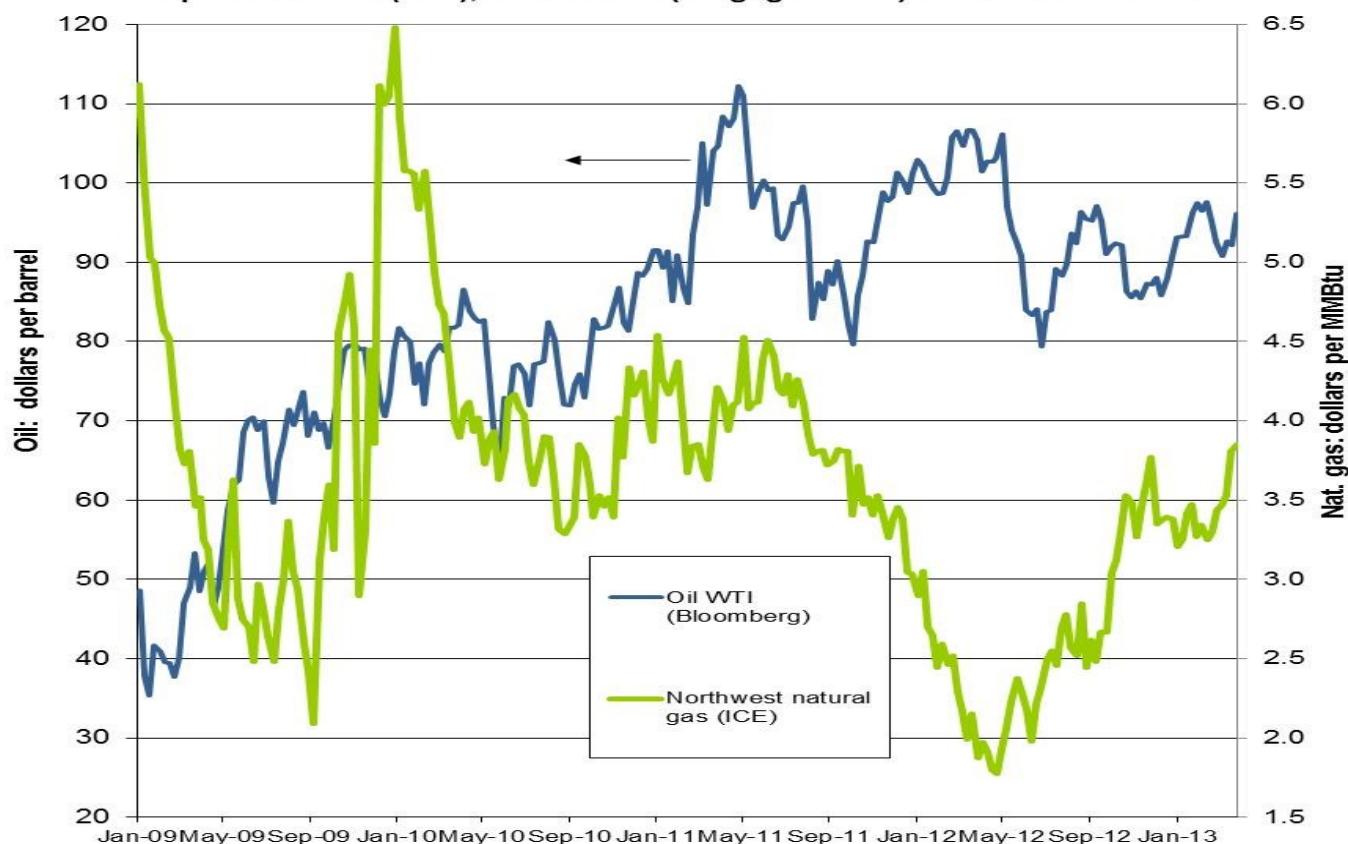
Topping off the biggest gas tank in the world. New York Times, Mar. 18.

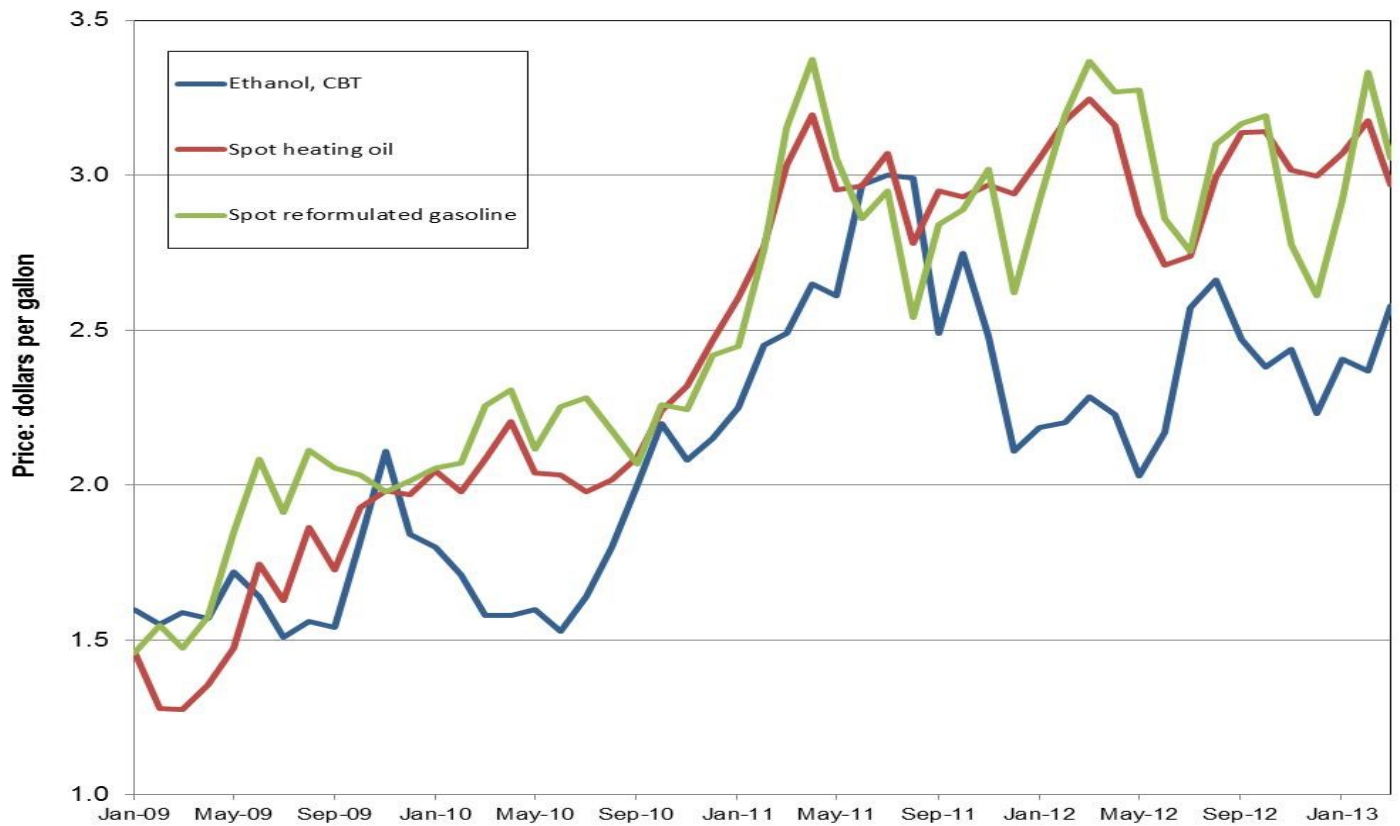
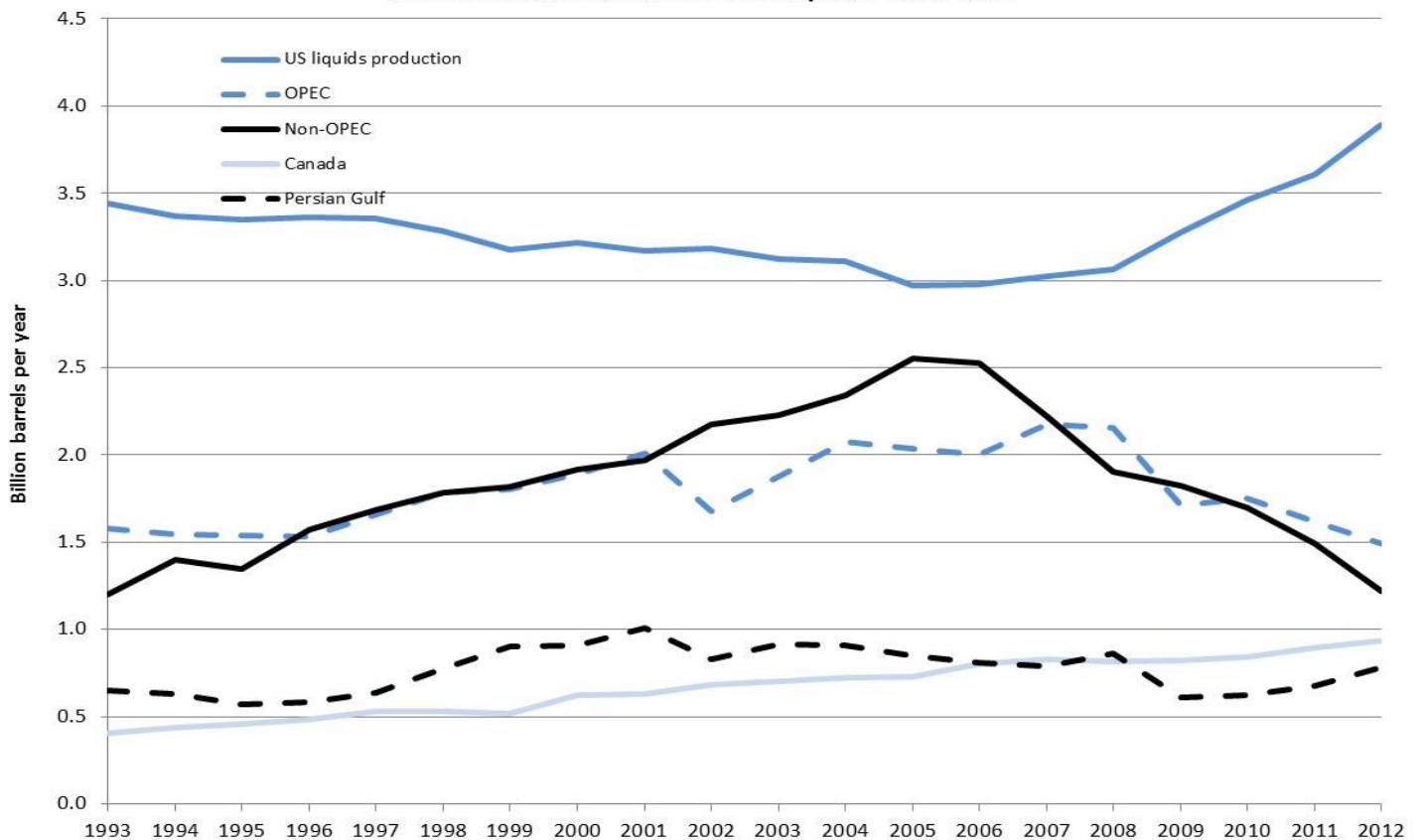
<http://www.nytimes.com/2004/12/07/business/07reserve.html?pagewanted=all>

Electricity, Petroleum & Natural Gas Prices

Energy Price Summary	Current	Month Ago	Year Ago
Monthly Range at Mid-C (Peak: \$ per MWh)	27-40	21-36	14-24
Average Mid C price (Peak hours \$ MWh)	37.2	29.1	18.6
Electricity WA Retail: Jan. (cents/kWh)	7.15	6.93	7.10
Natural gas spot price (next day: \$ per million BTU)	3.85	3.44	1.87
Natural gas futures (NYMEX next month: \$ per million BTU)	4.07	3.29	2.3
E85 (national average: \$ per gallon gasoline)	4.22	4.40	4.35
Ethanol (CBT next month contract: \$ per gallon)	2.58	2.37	2.28
Corn (\$ per bushel)	7.33	6.95	6.44
Petroleum, West Texas Intermediate: (\$ per barrel)	96.1	92.6	105.4
Seattle gasoline price (\$ per gallon)	3.83	3.83	4.14
Gasoline futures (NYMEX next month: \$ per gallon)	3.12	2.87	3.41
State diesel price (\$ per gallon)	4.12	4.22	4.48
Heating oil futures (NYMEX next month: \$ per gallon)	2.92	2.99	3.21
U.S. residential propane price report (Oct.-Mar.)	2.50	2.49	2.87
	US Avg	West Coast	West Coast
Clean Cities: Alternative Fuel Price Report, Jan. 2012	current	last qtr avg	current qtr
Ethanol E85 (\$ per gas gallon equiv.)	4.47	5.20	4.71
Biodiesel B20 (\$ per diesel gallon equiv.)	4.13	4.50	4.27
Biodiesel B99-100 (\$ per diesel gallon equiv.)	4.88	4.91	5.08
Compressed Natural Gas (\$ per gas gallon equiv.)	2.10	2.41	2.39
Propane (\$ per gas gallon equiv.)	3.70	3.91	4.04

Spot Crude Oil (WTI), Natural Gas (Kingsgate hub): Jan. 2009- Mar. 2013



Spot Market: Ethanol, Heating Oil and Reformulated Gasoline, Jan. 2009- Mar. 2013**U.S. Petroleum Production and Imports: 1993-2012**

River & Snow Pack Info

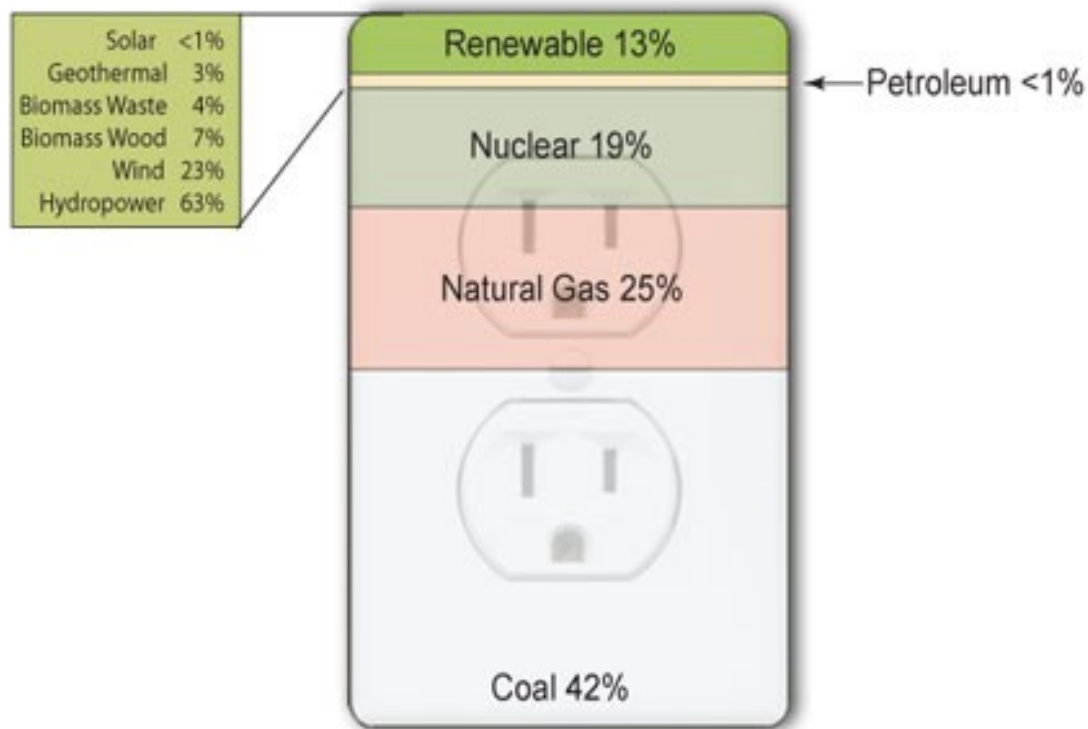
- Observed Feb. stream flow at The Dalles: 92% of average.
- Observed Feb. precipitation above The Dalles: 55% of average.
- Forecast runoff at The Dalles: Mar. 88% average flow
- Estimate of 2012-13 snow pack: Feb. 94% of normal.
- Federal hydropower generation in Feb.: 7,595 aMW, 2009-2013 average: 8,045 aMW.
- Reservoir content (Libby, Hungry Horse, Grand Coulee, Dworshak): Feb. 66%, 5-year average: 65%.

Power Exchanged

Average flow of power during the last 30 days
(updated on Feb. 28)

- California (exported to) 3,641 MW
- Canada (import from) 458 MW
- Net power exported: 3,183 MW

Sources of Electricity Generation, 2011



Note: Includes utility-scale generation only. Excludes most customer-sited generation, for example, residential and commercial rooftop solar installations

Source: U.S. Energy Information Administration, *Electric Power Monthly* (March 2012). Percentages based on Table 1.1, preliminary 2011 data.

U. S. Electricity Generation Sources In 2011

Of the 13% renewable, nearly all hydro was built before the mid-1970s. Most biomass is from lumber & paper mills. Biomass is mostly from burned municipal waste. A large portion of the solar is small-scale, customer-sited, and projected to generate 6.74 billion kilowatt-hours in 2012.

Energy Headlines—continued

International

Large Rise in Carbon Dioxide Emissions Sounds Climate Change Alarm. The Guardian.

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How Much is Norway Paying to Promote Electric Cars? Christian Science Monitor.

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Solar in the Spotlight. U-S News & World Report.

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Solar panel maker Suntech declares bankruptcy. USA Today, Mar. 20.

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National

Cities Weigh Taking Over From Private Utilities. New York Times.

<http://www.nytimes.com/2013/03/14/business/energy-environment/cities-weigh-taking-electricity-business-from-private-utilities.html?smid=tw-nytenvironment&seid=auto&r=2&pagewanted=all&>

U-S Solar Installations Soared 76% in 2012. Associated Press.

<http://www.heraldnet.com/article/20130314/BIZ/703149832>

Wind Generates More Than 10% of Electricity in Nine States. Energy Solutions.

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<http://nwpr.org/post/electric-vehicle-charger-help-balance-grid>

Study: Climate Change to Worsen Hurricane Storm Surge. USA Today.

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Major Changes for Greenhouse Gas Standards? Politico.

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<http://www.usatoday.com/story/money/business/2013/03/25/financing-green-tech-companies/1919633/>

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<http://www.nytimes.com/2013/03/20/business/us-example-offers-hope-for-cutting-carbon-emissions.html?pagewanted=all>

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Washington State House Oks Bill for Hydroelectricity in Canals. Tri-City Herald.
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California Utilities' Renewable Energy Spending Up. SF Chronicle.
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<http://belfercenter.ksg.harvard.edu/publication/22144/oil.html>

Leading Companies Contradict Own Actions on Climate Science. Union of Concerned Scientists, May 2012.
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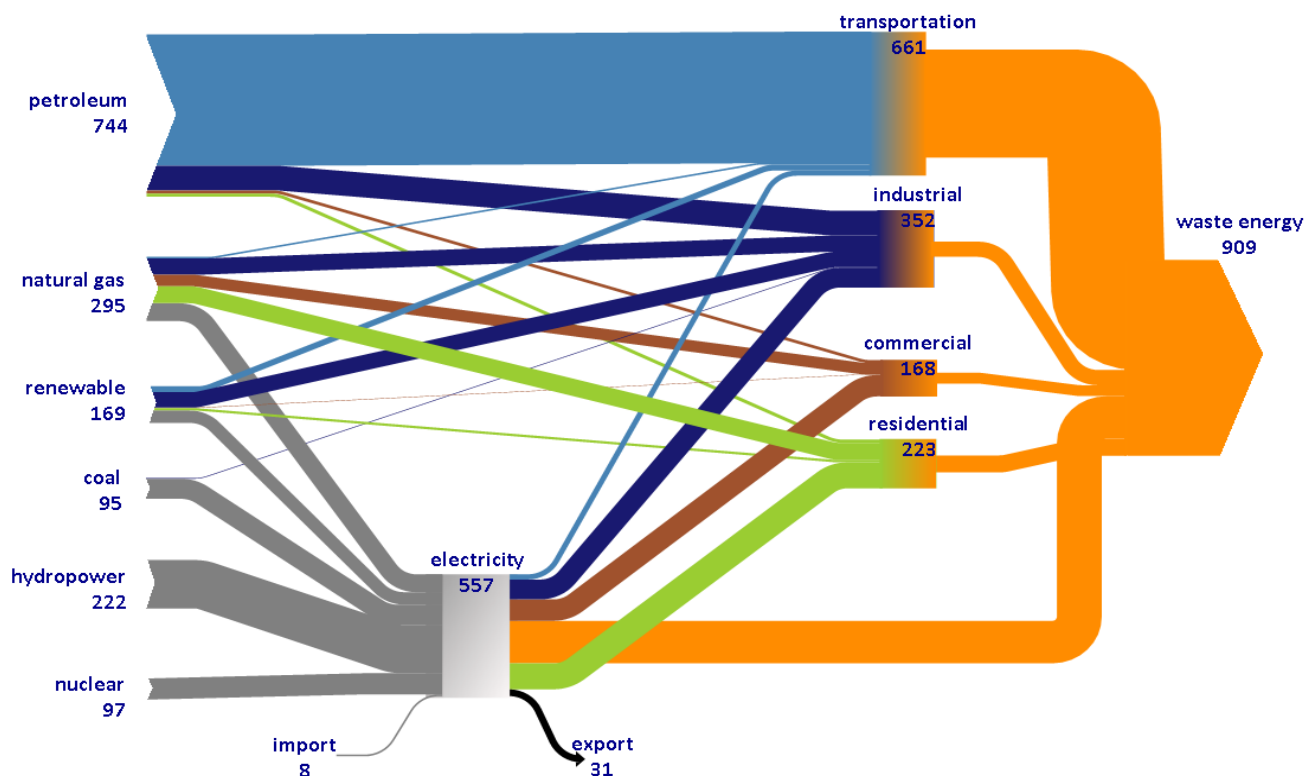
Understanding Household Preferences for Alternative- Fuel Vehicle Technologies. Mineta Transportation Institute. <http://www.transweb.sjsu.edu/project/2809.html>

Monthly feature article

THE LEGACY OF CAPTAIN SANKEY

An Irish mechanical engineer and captain in the British Army, Captain Matthew Henry Phineas Riall Sankey, institutionalized **Sankey diagrams** as a tool of energy analysis in 1898, when he published a widely circulated diagram of the thermal efficiency of a steam engine. In these diagrams, the width of each arrow represents the volume of energy.

Washington is one of only a handful of states that publishes its own state-level Sankey diagram of energy flows. We start with the most recent state-level energy data compiled by the federal government's Energy Information Administration. Here is Washington's Sankey diagram for calendar year 2010.



The numbers are measured in trillion British thermal units (TBTU). Of the 1,629 TBTU primary energy consumed during calendar year 2010, 557 TBTU was consumed by electric generators, and 1,071 TBTU went directly to the four consuming sectors (transportation, industrial, commercial and residential). The five grey-colored flows are the primary fuels supplied to electric generators; the electric generators (grey box) then convert these to electricity sent to the four sectors. A few of the electric generators are burning primary fuel outside Washington, and then transmitting the energy into the state.

The orange arrows show energy lost in the form of waste heat. The transportation sector is the least efficient user of primary energy, delivering only 26 percent of the primary energy as useful energy services, and losing the remainder as waste heat leaving vehicles' cooling systems and tailpipes. Energy supplied to the residential and commercial sectors is used mostly for heating, ventilating and air conditioning, and to a lesser degree for hot water, cooking, appliances and equipment. While the other three consuming sectors and the electric sector show a reasonable diversity of fuels, the transportation sector is dominated by, and dependent on, petroleum fuels. Washington is pursuing policies to thicken the narrow blue lines leading to the transportation sector thereby diversifying the transportation fuel mix.

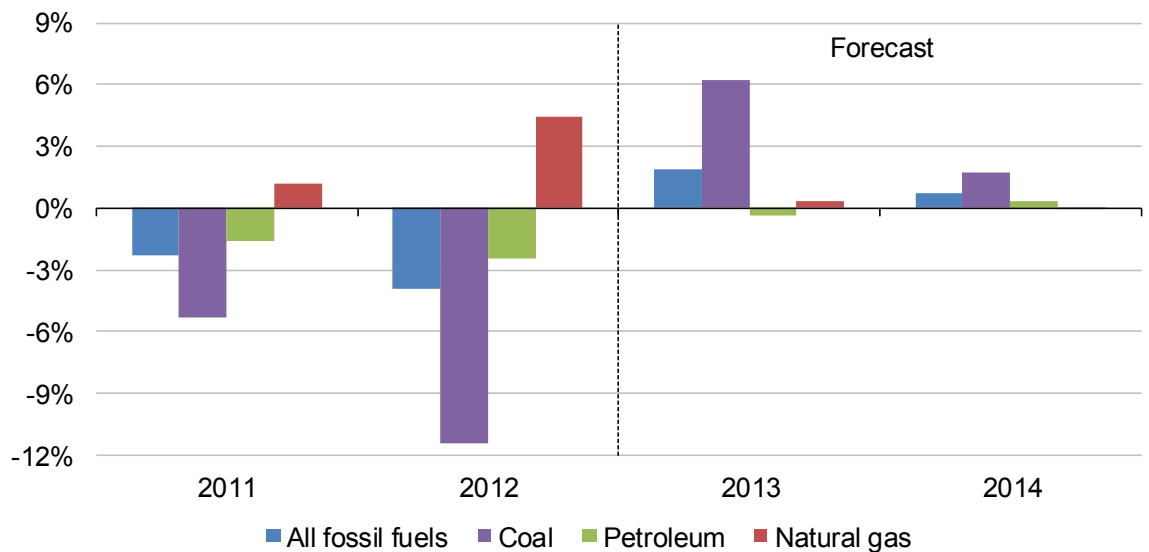
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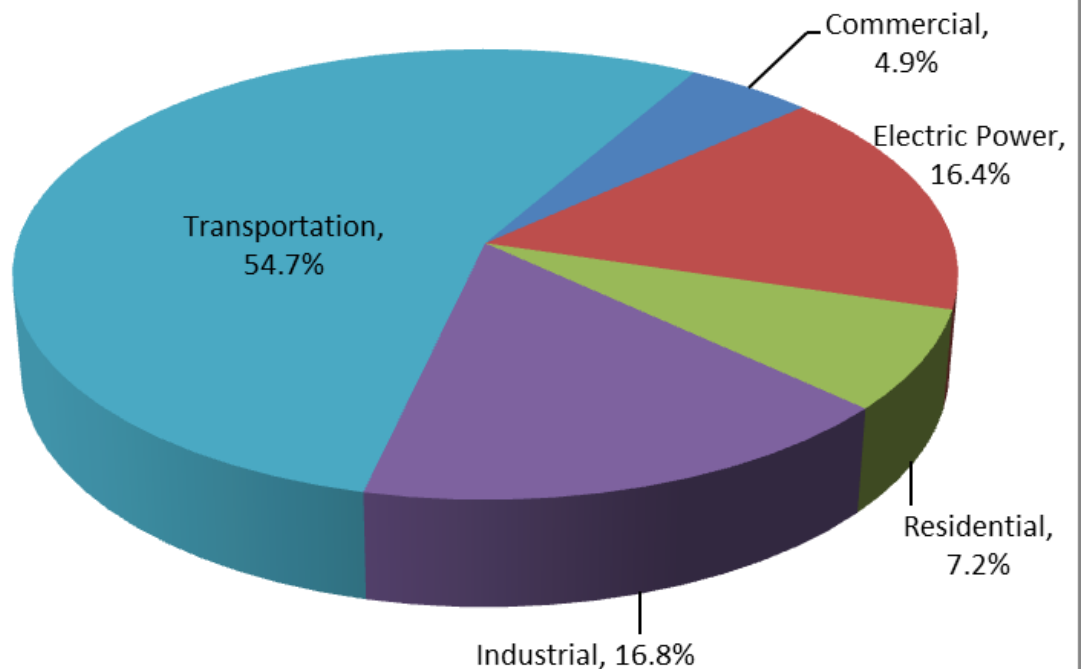
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U.S. Energy-Related Carbon Dioxide Emissions annual growth



Source: Short-Term Energy Outlook, March 2013

Washington state energy-related carbon dioxide emission shares by sector



Source: U.S. Energy Information Administration, State Energy Data System and EIA.
2009 data released 2012

